Postel

Network Working Group
Request for Comments: 17

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27 August 1969

Some Questions Re: HOST-IMP Protocol

1. Automatic deletion of links, as indicated in BBN 1822, page 11, seems bad:

   a) Link use may be dependent upon human use of a time share terminal - indefinite time between messages.

   b) Program using link may be slow due to:

      i) Busy HOST (many jobs)

      ii) Much local I/O and/or CPU time between messages - is it that, if a HOST's user fails to use a link for 15 seconds, the HOST network program must generate a dummy message merely to keep the link open?

2. Steve Crocker, HOST Software, 1969 Apr 7, asks on page 2: "Can a HOST, as opposed to its IMP, control RFNM's?" BBN, Report No. 1837, 1969 Jul, says on page 2: "The principal function of the (IMP) program...includes ....generating of RFNM's..." What if an IMP generates an RFNM and then discovers it cannot, for some reason, complete timely delivery of the last received message to its HOST? This seems especially pressing since I don't recall seeing anywhere an IMP constraint upon HOSTs that they must accept incoming messages within some specified maximum time.

3. A HOST has to be prepared to repeat transmissions of a message into network (see, e.g., Page 17, BBN 1822) therefore why the special discardable NOP message (Page 12, BBN 1822).

4. "Arbitrary delays," middle paragraph, page 23, BBN 1822, seems inconsistent with automatic link deletion questioned in 1 above. Normally the times involved differ by many orders of magnitude but a high priority non-network HOST responsibility could delay next bit for a long time.

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THE FOLLOWING COMMENTS ARE IN RESPONSE TO JOHN KREZNAR'S QUESTIONS WHICH WERE RAISED IN NWG:- 17

The deletion of a link entry from an IMP's link table will, in general, have no effect upon a Host transmission (or reception) at that IMP's site. Let us distinguish between non-use of a link in-between messages and non-use of a link due to Host program delays in the middle of transmitting or receiving a message. When the Host transmits a message on a link for which an entry is not in the link table, one will simply be inserted there. There is no need for "dummy" Host messages to keep a link "open" since a link is effectively always open. Only if the link table becomes full immediately after an entry is deleted (a situation we do not expect to occur) is there a possibility of resulting delay.

Arbitrary delays introduced by Host programs are also not inconsistent with the link entry deletion procedure. A link is blocked when the first access of the link table is made during transmission from the source IMP and is unblocked when the RFNM returns. Only non-blocked transmit link entries are deleted after 30 seconds of disuse. The statement on page 23 referencing *arbitrary* delays was only intended to have hardware implications insofar as the Host/IMP interface is designed to transfer bits asynchronously between the Host and the IMP.

A RFNM is returned from the destination IMP to the source IMP when a message reaches the head of the destination IMP's output queue to the Host (i.e. just before a message is sent to the Host). If a destination IMP cannot then deliver that full message to the Host, at most one more message may possibly arrive at that IMP due to the premature release of the RFNM. The new message will subsequently take its place at the end of the output queue to the Host thus guaranteeing the preservation of the proper message arrival sequence.

The NOP message is a special control message which is available for use during initiation of communication between the Host and its IMP. The Host may, of course, decline to send NOP messages during this period, but the first received message after IMP startup or after the Host ready indicator has gone on, may be discarded by the IMP. We do not require a Host to be prepared to repeat transmissions into the network.

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